



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/430,052 | 10/29/1999 | MATTHEW T. CRISFIELD | 5010/099 | 6709 |

32827 7590 10/02/2002

PATENTS
FAEGRE & BENSON LLP
1900 FIFTEENTH STREET
BOULDER, CO 80302

EXAMINER

MARTIR, LILYBETT

ART UNIT PAPER NUMBER

2855

DATE MAILED: 10/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/430,052

Applicant(s)

CRISFIELD ET AL.

Examiner

Lilybett Martir

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lew et al. (Pat. 5,663,509) in view of Wenger. et al. (Pat. 5,394,758). Lee et al. teach the claimed invention, including:

- A first flow tube as in element 44 having an inlet end and an outlet end, said first flow tube forming substantially a semicircle between said inlet end of said first flow tube and said outlet end of said first flow tube as noted in Figure 5; a second flow tube as in element 45 having an inlet end and an outlet end, said second flow tube forming substantially a semicircle between said inlet end of said second flow tube and said outlet end of said second flow tube; a driver as in element 48, affixed to said first flow tube at a point on said semicircular arc of said first flow tube; that is substantially perpendicular to a bending axis of said second flow tube, wherein said driver oscillates said first flow tube and said second flow tube in opposition to each other (Col. 11, lines 13-16); and sensors as in elements 50 and 51, affixed to said first flow tube in a position that allows detection, as in claim 1.

- An inlet manifold as in element 46, affixed to said inlet end of said first flow tube and said inlet end of said second flow tube to affix said first flow tube and said second flow tube to a pipeline, as in claim 2.
- A substantially 90 degree bend in a flow path through said inlet manifold (Note the bend in the flow path going from element 46 to elements 44 and 45) as in claims 3 and 5.
- An outlet manifold as in element 47, affixed to said outlet end of said first flow tube and said inlet end of said second flow tube to affix said first flow tube and said second flow tube to a pipeline, as in claim 4.
- An inlet manifold as in element 46, affixed to said inlet end of said first flow tube and said inlet end of said second flow tube to affix said first flow tube and said second flow tube to a pipeline; An outlet manifold as in element 47, affixed to said outlet end of said first flow tube and said inlet end of said second flow tube to affix said first flow tube and said second flow tube to a pipeline; and a spacer as in element 52, affixed to said inlet manifold and said outlet manifold to maintain a fixed distance between said inlet manifold and said outlet manifold, as in claim 6.
- An inlet end affixed to said inlet manifold as in element 46; an outlet end affixed to said outlet manifold as in element 47; as in claim 7.

But he does not teach:

- A first brace bar, affixed to said first flow tube proximate said inlet end of said first flow tube and affixed to said second flow tube proximate said inlet end of

said second flow tube; a second brace bar, affixed to said first flow tube proximate said outlet end of said first flow tube and affixed to said second flow tube proximate said outlet end of said second flow tube; and sensors that are pick-offs in a position that allow said pick-off sensors to a desired amount of Coriolis force at a low amplitude vibration, as in claim 1.

- A top side, a bottom side, a front side, and a back side each extending between said inlet end of a spacer and said outlet end of said spacer to form a rectangular body; and openings through said top side of said spacer through which said first flow tube and second flow tube are affixed to said inlet manifold and said outlet manifold, as in claim 7.

Wenger et al. (Pat. 5,394,758) teaches a coriolis type mass flow sensor having a first brace bar as in element 32, affixed to said first flow tube proximate said inlet end of said first flow tube and affixed to said second flow tube proximate said inlet end of said second flow tube; a second brace bar as in element 33, affixed to said first flow tube proximate said outlet end of said first flow tube and affixed to said second flow tube proximate said outlet end of said second flow tube; and sensors that are pick-offs as in elements 17 and 18 ; and a top side, a bottom side, a front side, and a back side each extending between said inlet end of a spacer and said outlet end of said spacer to form a rectangular body (Note that in Fig. 2, element 13 exhibits all of these features); and openings through said top side of said spacer (Col. 4, lines 4-7) through which said first flow tube and second flow tube are affixed to said inlet manifold and said outlet manifold.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the inertia force flowmeter of Lew et al. by using the teachings of the coriolis mass flowmeter of Wenger et al. providing said inertia force flowmeter with brace bars positioned near the inlet and the outlet of the flow tubes, for the purpose of controlling the oscillations of the flow tubes; by providing sensors that are pickoffs positioned in place of the differential pressure sensors in Figure 5 of Lew et al., for the purpose of measuring the vibrations produced in the coriolis flow meter and converting said mechanical movements into electrical signals; and by providing Lew et al. with a rectangular body that extends between the inlet and the outlet of the device, for the purpose of maintaining a constant distance between the inlet manifold and the outlet manifold of the flowmeter therefore improving the accuracy and reliability of the desired flow measurements.

Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lew et al. in view of Wenger et al. as applied to claim 7 above, and further in view of Ollila et al. (Pat. 6,044,715). Lew et al. in view of Wenger et al. disclose the claimed invention, except for:

- A casing that encloses said first flow tube and second flow tube affixed to said top side of said spacer, as in claim 8.
- A front-side wall; a back side wall; and a mass affixed to said front side and said back side wall to change vibrational modes of said housing, as in claim 9.

Ollila et al. teaches a coriolis effect mass sensor as in element 400 that has a housing composed by elements 701 and 450. Said housing has a front side wall 701, a back side wall 450 and a mass as in elements 703 and 704, that is affixed to said front side wall and said back side wall to change vibrational modes of said housing.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mass flow sensor of Lew et al. as modified by Wenger et al. using the teachings of Ollila et al. for the purpose of protecting the sensor from the atmosphere that surrounds it thereby minimizing any impact on it's measurement performance.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lew et al. in view of Wenger et al. as applied to claim 1 above. Lew et al. in view of Wenger et al. disclose the claimed invention, except for:

- The position of said pick-off sensors is substantially 20-50 degrees from said bending axes of said first and said second flow tube, as in claim 10.
- The position of said pick-off sensors is 30 degrees from said bending axes of said first and said second flow tube, as in claim 11.

Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233; and since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70, it would have been obvious to one of ordinary skill in the art at the time the invention was made to position in Wenger et al. pick-off sensors in a selected angle relative to said first and

second flow tubes for the purpose of detecting the greatest amount of Coriolis forces caused by the flowing material.

Response to Arguments

Applicant's arguments filed July 3, 2002 have been fully considered but they are not persuasive. Applicant's arguments regarding Lew et al. not teaching a flow tube substantially semicircular shape are not persuasive, since by definition "substantially" indicates that said flow pipe is "largely but not wholly that which is specified" (See Merriam Websters Collegiate Dictionary, Page 1174), and Lew's pipe is largely but not wholly semicircular (See Figure 5). When Figure 1 in applicant's specification is compared with Figure 5 of Lew et al. the shape of the flow tubes is found to be similar, and since In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. A mere variation of the shape and dimensions of a portion of a known device is not found to be patentably distinct, but rather it is expected that variations on it's shape and dimensions could be performed by the artisan who teaches it without changing the scope of his invention in an experimental manner in order to make his device suitable to or fit for a specific use or situation.

Citation of Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art considered pertinent during examination of the examined application is:

- Keita et al. (Pat. 5,796,011) Coriolis-type mass flow sensor. Abstract and Figures 1,5,and 7.
- Cage (Pat. 4,895,031) Sensor mounting for Coriolis mass flow rate meter. Abstract and Figures 2 and 5.
- Crisfield et al. (Pat. 6,308,580) Coriolis flowmeter having a reduced flag dimension. Abstract and Figures 1-3.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (703)305-6900. The examiner can normally be reached on 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Fuller can be reached on (703)308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3432 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LM

Lilybett Martir
Examiner
Art Unit 2855

RCM
September 26, 2002


HARSHAD PATEL
PRIMARY EXAMINER